Lighting your home

PowerHouse®

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When it comes to buying light bulbs, the shelves are filled with a huge array of options. Many consumers are bewildered by the choices available, so they reach for the same kind they've used for years — the standard incandescent — pausing only to check the wattage.

But there's more to finding the right lighting for your home than 40-, 60- or 100-watts. There are bulbs designed for almost every situation, from displaying artwork to lighting a path to your front door. There are sizes and shapes to fit every fixture, and technologies that can reduce energy consumption by more than half.

Lighting can account for up to 20 percent of your household electricity costs, and we want to help you get the most value from your energy. In this brochure, you'll find great tips on:

- Understanding lighting terms
- Determining your lighting needs
- Choosing the best light bulbs
- Saving energy — and money

Lighting terminology

The first step in improving the lighting in your home is understanding all the lighting terms you'll see on packages and in product literature.

How lighting is measured

- Watts measure the amount of energy needed to power the bulb.
- A lumen measures how much light a bulb produces. A 100-watt incandescent bulb produces about 1750 lumens.
- The energy efficiency, or "efficacy," of a bulb is measured by lumens per watt. Divide the lumens produced by the numbers of watts used; the higher the total, the more energy efficient the bulb.

How lighting is measured - continued

- Each bulb has a "color temperature" based on its "coolness" (red, yellow, orange) or "warmness" (blue, green). Cool light produces higher contrasts, so it's good for specific tasks like reading or work. Warm light is better for general lighting in homes because it flatters skin tones and clothing.

- Bulbs are also measured according to their "color rendering index," or how true colors appear compared to bright sunlight. Incandescent bulbs are closest to natural sunlight; high-pressure sodium lights, used in many commercial applications, render colors poorly — which is why it's sometimes difficult to distinguish between similar colors in stores.

Types of lighting

- Incandescent bulbs use a coil of tungsten wire that glows when heated by an electrical current — the same technology developed by Thomas Edison more than 100 years ago.

- Fluorescent bulbs produce light from an electrical current running through a mixture of mercury and inert gases. Types of fluorescent bulbs include tubular and compact.

- Halogen bulbs, despite the difference in name, are actually a form of incandescent.

- High-intensity discharge bulbs are usually used in commercial buildings and outdoor areas. These bulbs, which include mercury vapor, metal halide and high-pressure sodium lights, use an arc of electricity to produce a very bright glow.

Incandescent vs. fluorescent

The standard incandescent bulbs that light your home cost the least to purchase, but the most to operate. A typical standard incandescent produces only 8-22 lumens per watt of electricity used, which means we have to use higher wattages to achieve the illumination we need. Only 10 percent of the energy consumed by a standard incandescent is used to produce light; the rest is wasted as heat.

Incandescents also have the shortest lives of any household lighting option. Don't be fooled by the "long-life" bulbs available — they actually use more energy than regular bulbs, because the tungsten filament that produces the light is thicker.

Halogen bulbs, used in the popular "torchiere"-style floor lamps, provide only a minimal energy savings over standard incandescents. While they do produce a brighter, whiter light, they also produce an intense amount of heat, making them a fire hazard and difficult to handle.

The next time you need to buy light bulbs for your home, take a moment to look at the fluorescent lights available. Compact fluorescent bulbs (CFBs) come in a wide variety of shapes and sizes to suit almost any type of lighting fixture.

CFBs have two distinct advantages over standard incandescent bulbs:

1. They use 75 percent less energy to produce the same amount of light. An 18-watt CFB can replace a 100-watt incandescent.

2. They last ten times longer — up to 10,000 hours per bulb, compared to less than 1,000 hours for an incandescent.

Incandescent vs. fluorescent - continued

CFBs are more expensive to purchase ($5-20 per bulb, depending on the size), but keep in mind that they can pay for themselves in energy savings in about two years — and they'll last for two more years. If you replace a 60-watt incandescent with a 15-watt CFB and use it six hours a day, you could see an energy savings of more than $40 over the four-year life of the bulb. Plus, you'll also save on the cost of purchasing at least eight incandescent bulbs during that time (and numerous trips to the store) — and that's just one fixture.

CFBs also produce less heat than incandescents, and significantly less heat than halogen bulbs.

According to the U.S. Department of Energy, American households could save 31.7 billion kilowatt-hours of electricity annually by switching to compact fluorescent lights. That's enough electricity to light about one-third of all U.S. households for an entire year.

Using compact fluorescent bulbs

A CFB needs a device called a ballast, which limits current flow. The ballast can be separate (modular) or already attached to the bulb (integral); in some cases, the ballast will be part of the fixture itself. Newer fluorescent bulbs, like CFBs, use electronic ballasts, which have virtually eliminated the annoying buzzing and flickering common with older fluorescents with magnetic ballasts.

Using compact fluorescent bulbs - continued

You can get the most benefit from an investment in CFBs by following these tips:

- Replace incandescents with the correct wattage CFB (see chart).
- Install CFBs in hard-to-reach areas, such as hallways, closets, vaulted ceilings, etc. You shouldn't have to climb a ladder again for years!
- CFBs are great for outdoor use, but make sure it has a cold-weather ballast.
- A wide variety of sizes and shapes, including circular, are available, so be sure to measure the fixture before purchasing a CFB. Inexpensive socket extenders and harp wideners are available to adapt table and floor lamps.

- CFBs can be used with timers, motion sensors and occupancy sensors. Manufacturers are introducing new CFBs designed specifically for use with dimmer switches.
- CFBs can be used in many types of halogen lamps, saving energy and greatly reducing the risk of overheating and fire.

Saving energy with incandescents

Switching to compact fluorescent bulbs is an investment, so you'll probably make the change gradually. Even if you don't replace every incandescent in your home with a CFB, there are still many ways to save energy:

- Let in as much natural sunlight as possible by opening drapes and raising shades or blinds.
- In fixtures with multiple sockets, use a single higher-wattage bulb instead of several smaller-wattage bulbs. A 100-watt bulb produces 50% more light than four 25-watt bulbs — for the same amount of energy. (Make sure the bulb wattage doesn't exceed the recommended level for the fixture.)
- Use dimmer controls and three-way bulbs to lower lighting levels when bright light isn't needed.
- Use motion or occupancy sensors where you might not notice if a light is left on, such as a basement, garage, attic or closet.

Saving energy with incandescents - continued

- Instead of high-intensity floodlights outdoors, install a photocell on a porch light or switch to low-voltage garden lights.
- Dust light fixtures and bulbs often. A heavy coat of dust can block up to 50 percent of light output.
- Keep lamps away from thermostats; the heat produced can cause your furnace to run less than needed or your air conditioner more than needed.
- And as always, turn off any lights you're not using.

Lighting methods

Take a look around your home, and you'll likely find a variety of lighting situations, each with its own special needs. When purchasing a light bulb, consider how and when the fixture is used. By choosing the right light bulbs, you can enjoy every activity in your home with more comfort.

General lighting

Called ambient lighting by professionals, general lighting is a substitute for sunlight. It illuminates a large area. Overhead fixtures, floor lamps and lighted ceiling fans are examples of general lighting.

Higher wattages are rarely needed for general lighting, and one bulb in a multi-socket fixture usually provides enough light for most general activities.

Task lighting

This is functional, localized light used for a specific activity, such as reading, studying or playing the piano.

Task lighting should provide a bright glow, but without glare or shadow. Lamps used for reading, working or studying should be adjustable for use by different family members; under-cabinet fixtures are great for cooking and reading recipes.

Accent lighting

If you like to display artwork, a collection, or other objects around your home, accent lighting can add eye-catching highlights. Accent lighting is also used to focus attention on architectural elements like windows, fireplaces, or doorways.

Accent lighting should be at least three times brighter than general lighting in the surrounding room.

Before installing accent lights, test a variety of bulbs and positions beforehand to find the desired effect. "Uplighting" a large plant or window treatment can create dramatic shadows; diffuse "downlighting" is great for framed artwork.

Security/outdoor lighting

Outdoor lighting can range from high-intensity floodlights to low-voltage garden lights.

Floodlights and spotlights can consume a lot of energy if left on for long periods of time, so use them sparingly, or install devices like motion sensors, timers or photocells.

If you've invested time and effort into the exterior of your home, highlight your garden or landscaping after dark with low-voltage, in-ground fixtures. This type of lighting is also great for patio and deck areas, because the softer light is less likely to attract annoying insects.

For more information

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